

CEMENT TEST EQUIPMENT, INC.

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Tulsa, Oklahoma, USA

# Constant Speed Mixer Instruction Manual

CEMENT TEST EQUIPMENT, INC.

# **Constant Speed Mixer User's Manual**

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## Introduction

*This chapter contains general information about the mixer and its uses as well as detailed specifications for the instrument.*

### Uses of a Constant Speed Mixer

Cements are a critical element in the drilling, completion, work over, and abandonment of wells. For each application, a cement slurry is designed with specific properties and is given additives that provide predictable slurry density, volume, viscosity, compressive strength, fluid loss, gas migration, and thickening time. The constant speed mixer is typically used to prepare a cement slurry prior to laboratory testing. The typical test methods are listed in API Specification 10 on Oilwell Cements.

#### ICON KEY



Important  
information



Potential Danger or  
Safety Hazard



Operational Warning

### Description of the Instrument

The Model 7000 Constant Speed Mixer is used to mix cement slurries at specific speeds and times for laboratory testing. The mixer has a tachometer to indicate the mixing speed and two pre-set speeds that are user adjustable, but are typically set for 4,000 rpm and 12,000 rpm. The unit is equipped with a timer that allows precise mixing times for any combination of mixer speeds. The instrument also has a variable speed option that allows the speed to be varied using a potentiometer on the control panel.

The mixing container is stainless steel with a plastic lid. The mixing blade assembly uses an o-ring seal for greater leak resistance and a

## INTRODUCTION

special hardened blade designed to give up to 10 times longer life than conventional unhardened blades.

## Instrument Specifications

The specifications below apply to all CTE, Inc. constant speed mixers.

### ELECTRICAL

Input Voltage:	115 VAC or 230 VAC ( $\pm 10\%$ )
Input Power:	500W
Current:	4.2 A (115 VAC) 2.1 A (230 VAC)
Input Frequency:	50-60 Hz

### MECHANICAL

Height:	26.5 in. (67 cm); 40 in (101.6 cm)
Width:	11 in. (28 cm)
Depth:	16 in. (41 cm)
Weight:	21 lb. (9.5 kg); 35 lb. (15.9 kg)

### ENVIRONMENTAL

Operating Temperature:	(32 to 105°F) 0-40°C
Operating Humidity:	0-95% non-condensing

### DRIVE MOTOR

Drive Motor:	9/16 hp (420 W)
Drive Speed:	2,000-24,000 rpm (variable)

## Installation

Before operating the instrument, it is a good idea to check for loose screws or bolts that may have come loose during shipment. This is particularly true for overseas shipments.

Upon uncrating the instrument, verify that the instrument and any spare parts on the packing have been received and are undamaged. Notify CTE if anything is missing or damaged.

The mixer may be shipped in an unassembled condition for ease of shipment. Assembly requires no tools. Locate the mixer base and

## INTRODUCTION

place on a firm level surface. Slide the two aluminum mounting poles into the sleeves on the mixer base. Slide the two holes in the bottom of the electrical cabinet over the mounting poles and into the sleeves in the top of the cabinet. Place the mixer motor on the mixer base. Connect the two cables from the mixer motor to the appropriate receptacles on the bottom of the electrical cabinet. Mixer assembly is now complete.

Electrical connections are made using the three pronged receptacle on the rear of the instrument. An electrical cord is supplied with the instrument, but an appropriate plug for power must be supplied by the user. Please observe the following precautions when making the wiring connections.



- Wiring should be done by a qualified installer in accordance with local electrical codes.
- The instrument should be securely connected to a separate earth ground. The ground wire must be larger in diameter than the supply conductors.

## Operation and Calibration

*Chapter 2 will discuss in detail the steps required to operate and calibrate the instrument.*

The constant speed mixer is very easy to use. To operate the instrument, simply follow the steps listed below.

### Operating the Mixer

To mix cement slurry, follow the directions below. Refer to API Specification 10 for more information.

1. Pour the appropriate amount of water into the mixer container.
2. Turn the **POWER** switch to the ON position.
3. Press the **MIX 1** switch until it clicks into position.
4. Place the **FIXED/VARIABLE** switch in the **FIXED** position.
5. Press the **START/RESET** pushbutton to start the motor and begin the timer countdown from 50 seconds.
6. Add the cement to the water during the first 15 seconds while mixing at low speed (typically 4000 rpm).
7. After the cement has been added, place the cover on the mixer container.
8. When the timer reaches 35 seconds, press the **MIX 2** button and mix on high speed (typically 12,000 rpm) for 35 seconds. When the timer reaches zero, the motor will stop automatically.

## Adjustment and Calibration

If the **MIX 1** or **MIX 2** speed values are not within  $\pm 100$  rpm of the desired speed, it may be necessary to adjust the **MIX 1** or **MIX 2** values. To adjust the **MIX 1** value, follow the steps below.

1. Pry off the small black cap next to the **MIX 1** button.
2. Under the cap is a small screw. Turn this screw clockwise to increase the **MIX 1** speed and counterclockwise to decrease the **MIX 1** speed.
3. Replace the cap when the desired speed is obtained.

To check the accuracy of the mixer speed, a non-contacting tachometer capable of measuring speeds in excess of 12,000 rpm must be used.

## Adjustment of Speed Sensor Gap

Check the gap between the speed sensor and the motor shaft sprocket on the bottom on the mixer base. If the sensor is too close or too far from the sprocket, it makes speed control difficult. It is typical to start with a gap thickness similar to a business card (.25-.30 mm) and adjust it from there. If there is trouble on the high speeds, try increasing the gap a small amount. This may be similar to a trial and error procedure. If the sensor is moved out too far, it may control OK at high speeds but not at the low speeds. The opposite will occur if the gap is too small.



**Chapter**  
**3**

## Parts List

*This chapter contains a parts list of commonly used replacement parts.*

**M**ixers can be relatively reliable and trouble free—provided they are serviced and maintained properly. Instruments that are neglected and receive infrequent service or are subject to abuse are certain to cause trouble.

The following is a table of frequently used replacement parts along with the CTE part numbers.

Description	Part Number	Item Number
Drive Stud	C-0333	48
Slinger	C-0612	50
Cap Nut	C-0609	3
Blade, Hardened	C-0095	4
Bearing Cap	7-0012	5
Washer	C-0334	6
Bearing Holder	7-0011	7
Washer (SST)	C-0613	9
Washer (rubber)	C-0331	10
Washer (plastic)	C-0611	11
Shaft	C-0332	12
Center Lid	C-0614	15
Container (SST)	C-0615	17
Base Gasket	C-0329	18
Container Base	C-0616	19
Center Lid	C-0617	1

**MAINTENANCE, SERVICING, AND TROUBLESHOOTING**

Description	Part Number	Item Number
Outer Lid (vinyl)	C-0618	16
Mixing Blade Assembly	7-0010	
O-ring	C-0147	
Base	7-0021	
Support Tube	7-0022	
Switch (Power)	C-0075	
Switch (Variable/Fixed)	C-0076	
Tachometer	C-0152	
Switch (Start/Reset)	C-0159	
Speed Control Board	C-0162	
Power Control Unit	C-0163	
Potentiometer	C-0163-1	
Motor Brush and Spring Set	C-0298	
Lid Assembly (SST)	C-0330	501017
Drive Stud Washer	C-0351	49
Whole Container Assembly, SST	07-0009	CAC33
Timer	C-0164	
Washer/Nylon	C-1387	8
Hex Nut, Left Hand	C-0673	13
Jar Pad	C-1353	20
Coupling Assembly	C-1352	21

All other Waring parts available. Please call us for pricing.

# WARING COMMERCIAL®

## 7009G

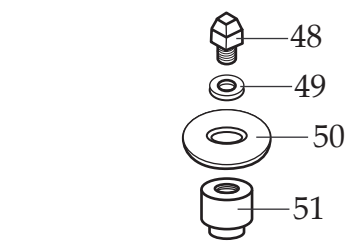
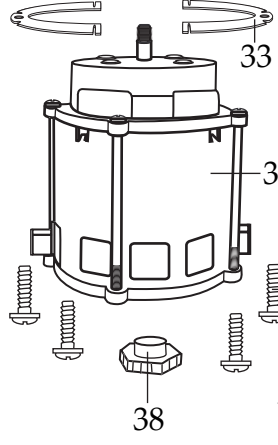
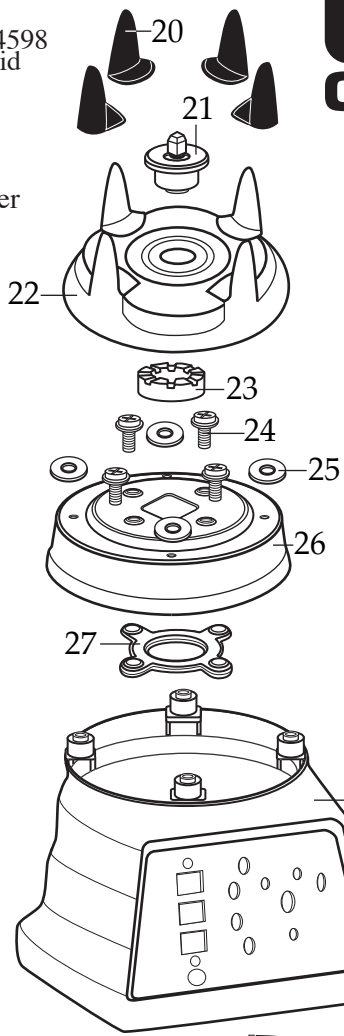
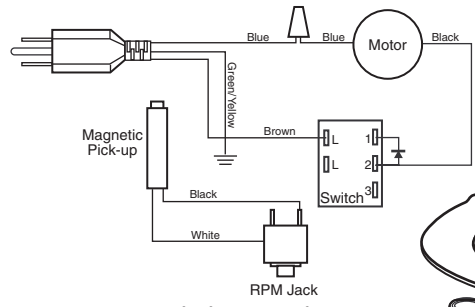
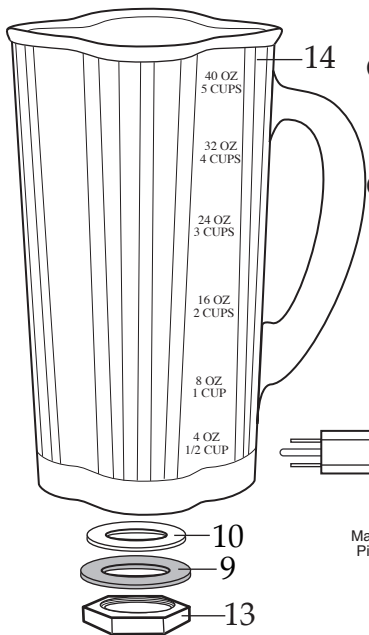
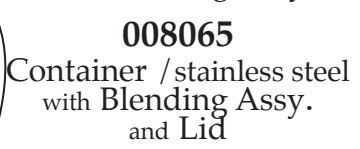
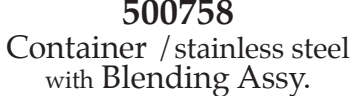
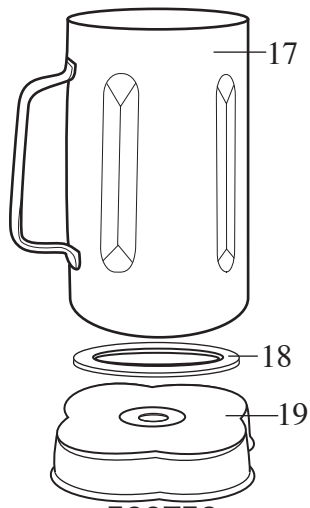
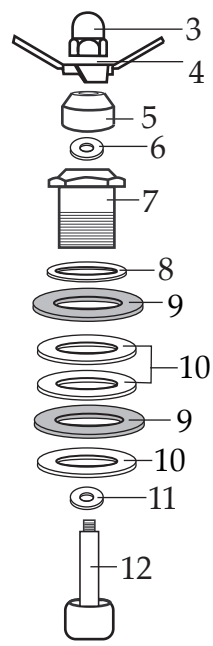
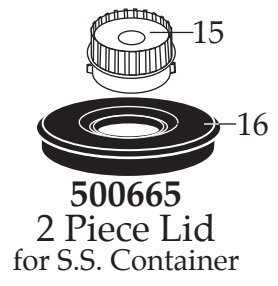
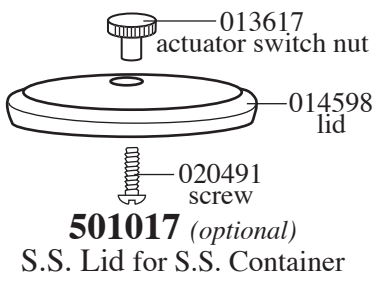
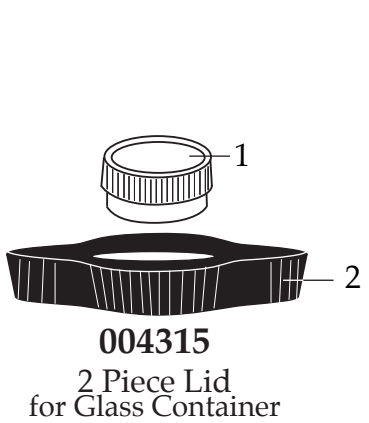
Blender with Tachometer Jack and Glass Container

## 7009S

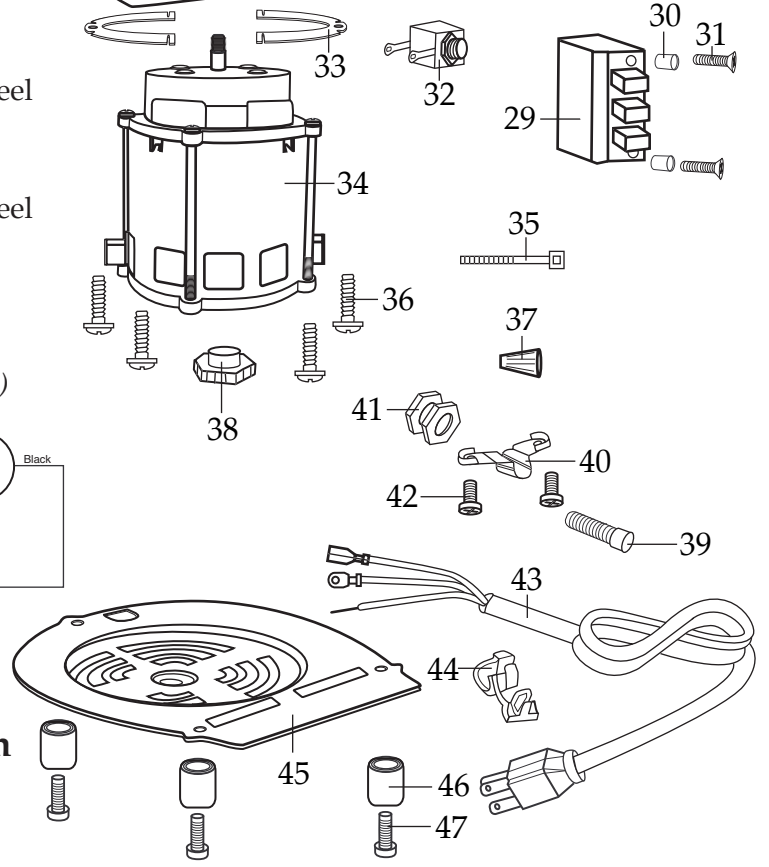
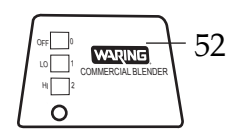
Blender with Tachometer Jack and Stainless Steel Container

## 7009L

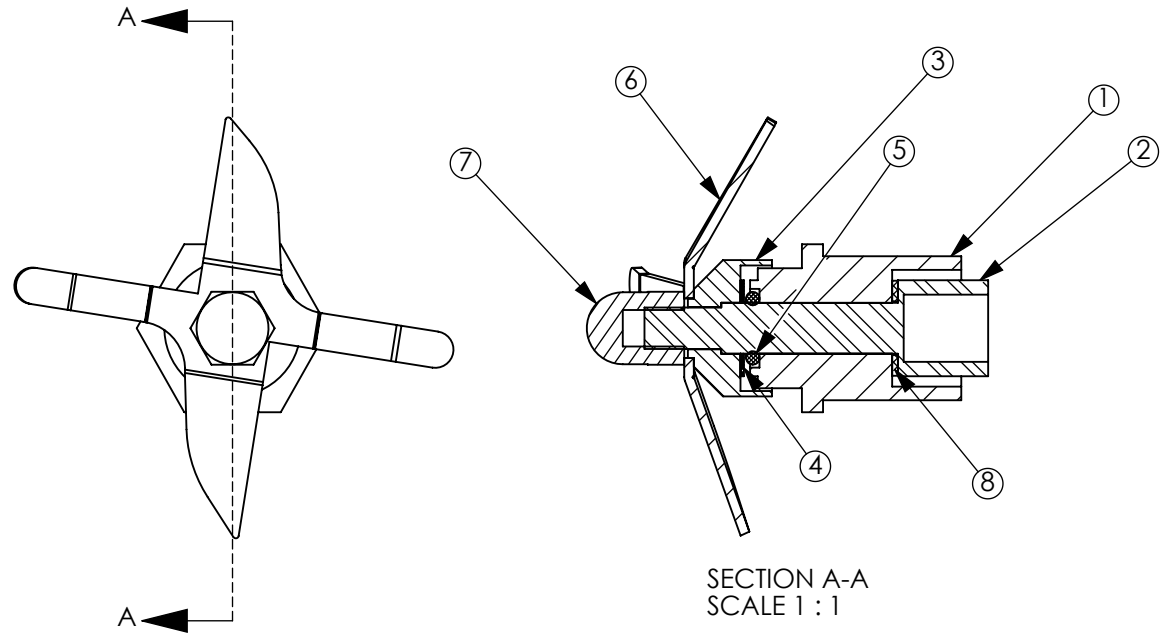
Laboratory Blender with Stainless Steel Container



**003559**  
Drive Coupling  
(parts that can be purchased separately)



THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF CEMENT TEST EQUIPMENT. ANY REPRODUCTION IN PART OR WHOLE WITHOUT THE WRITTEN PERMISSION OF CEMENT TEST EQUIPMENT IS PROHIBITED.

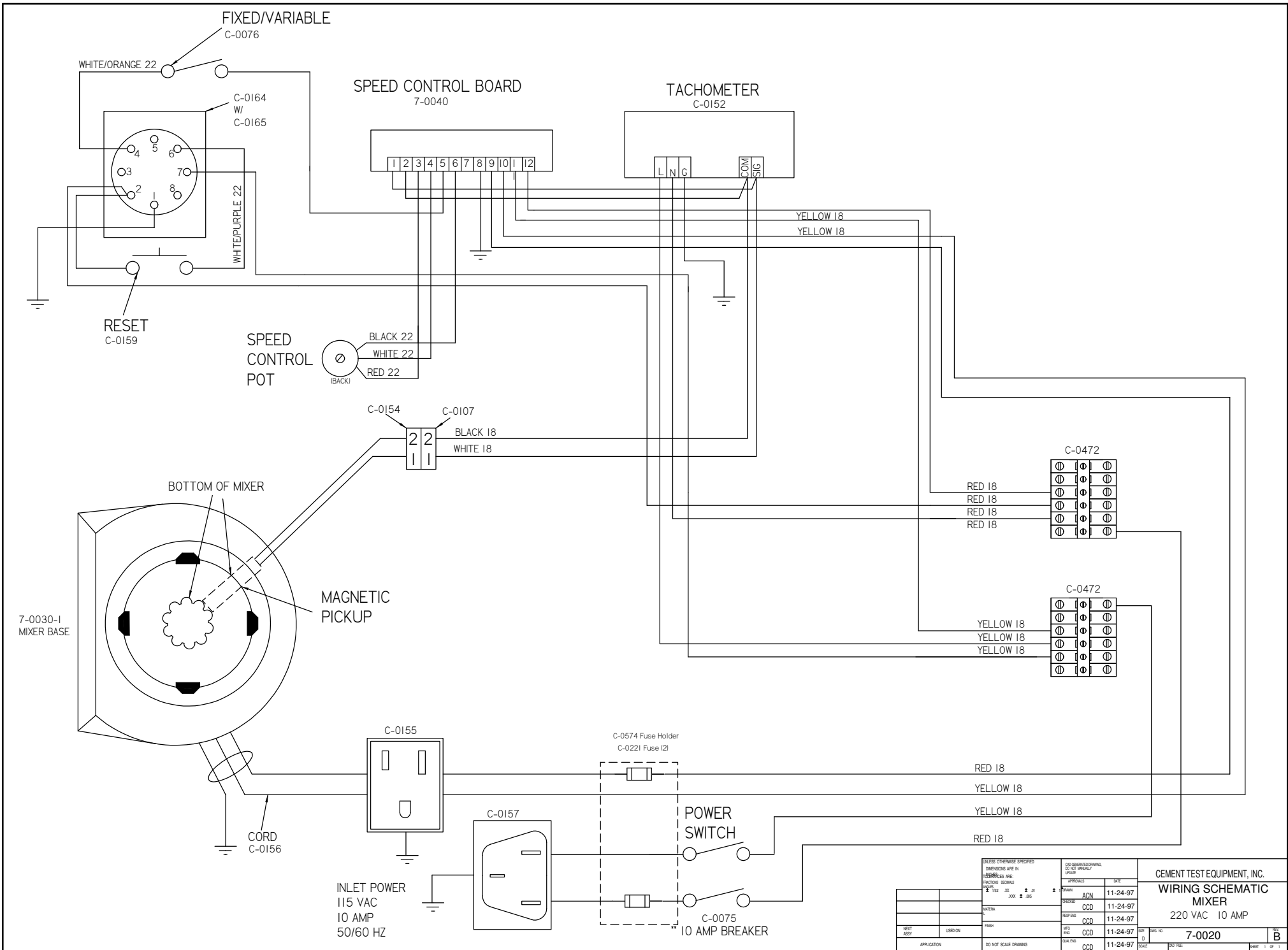


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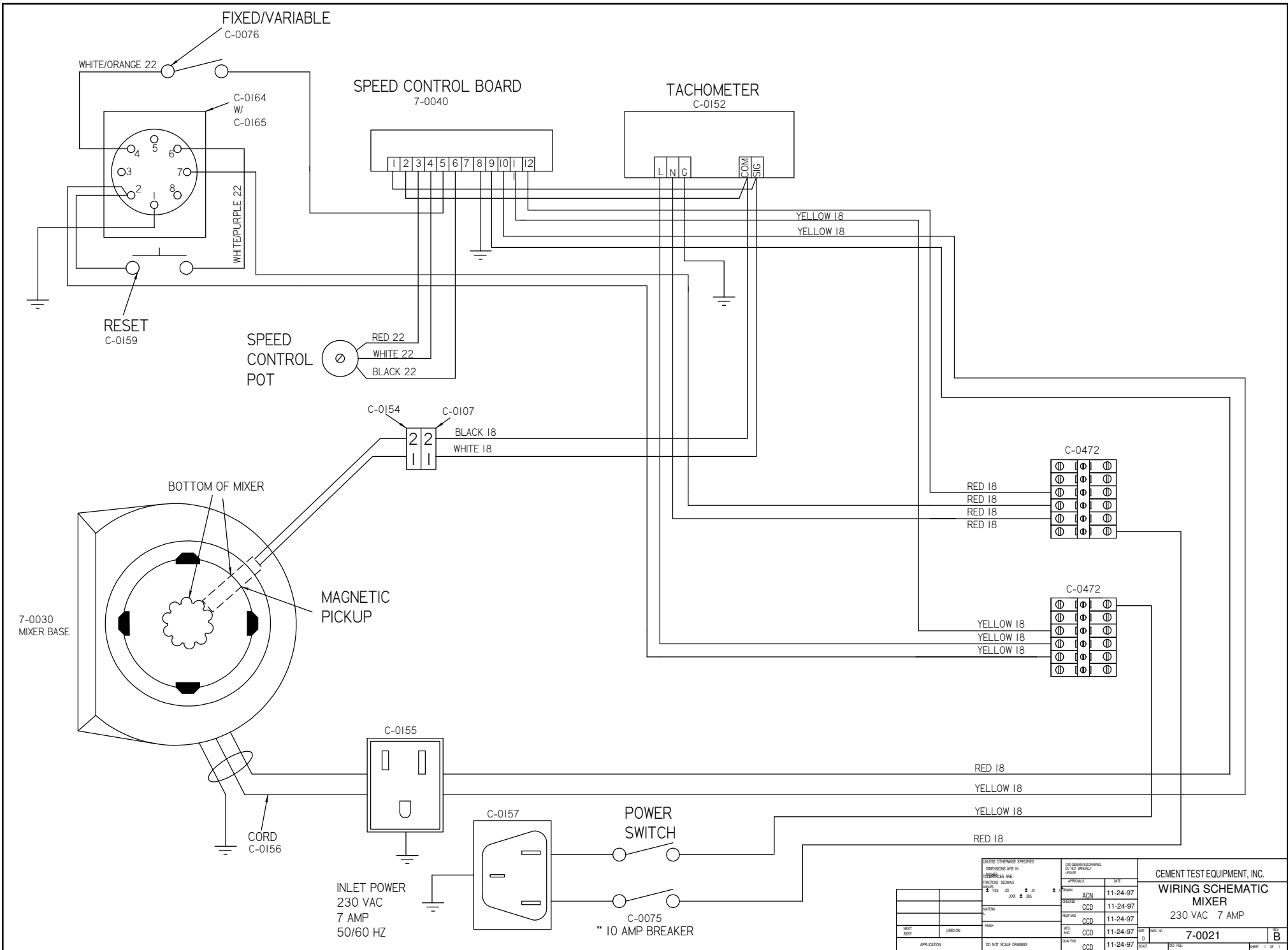
1. BEVELED EDGE OF BLADE POINTS DOWN
2. APPLY GREASE TO O-RING C-0147

ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	7-0011	Body
2	1	C-0332	Shaft
3	1	7-0012	Cap
4	1	C-0334	Washer (Optional)
5	1	C-0147	O-ring
6	1	C-0095	Blade
7	1	C-0609	Acorn Nut
8	1	C-0611	Washer

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES ±1/32 .XX ±.01 ±1° .XXX ±.005		CAD GENERATED DRAWING, DO NOT MANUALLY UPDATE		CEMENT TEST EQUIPMENT	
		APPROVALS	DATE		
NEXT ASSY	USED ON	DRAWN	CCD	4-9-98	BLADE ASSEMBLY
		CHECKED	CCD	4-9-98	
		RESP ENG	CCD	4-9-98	
		MFG ENG	CCD	4-9-98	
APPLICATION	DO NOT SCALE DRAWING	QUAL ENG	CCD	4-9-98	SIZE A DWG. NO. 7-0010 REV. A
					SCALE 1:1 CAD FILE: SHEET 1 OF 1



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES UNLESS OTHERWISE ARE SPECIFIED		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES UNLESS OTHERWISE ARE SPECIFIED		CEMENT TEST EQUIPMENT, INC.	
APPROVALS	DATE	APPROVALS	DATE	WIRING SCHEMATIC	
DESIGN	11-24-97	DESIGN	11-24-97	MIXER	
REVISION	CCD	REVISION	CCD	220 VAC 10 AMP	
DATE	11-24-97	DATE	11-24-97	7-0020	
APP. NO.	CCD	APP. NO.	CCD	B	
QUAL. ENG.	11-24-97	QUAL. ENG.	11-24-97	PAGE 1 OF 1	
APPLICATION	DO NOT SCALE DRAWING	APPLICATION	DO NOT SCALE DRAWING		



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES UNLESS ARE FRACTIONS DENOMINATORS ARE 1/32 XX XXX ± .01		CONVENTIONS DO NOT UNLESS SPECIFIED		APPROVALS		DATE		CEMENT TEST EQUIPMENT, INC.		
DESIGNED BY	ACN	11-24-97	APPROVED BY	CCD	11-24-97	WIRING SCHEMATIC		MIXER		
DRAWN BY	CCD	11-24-97	TESTED BY	CCD	11-24-97	230 VAC 7 AMP				
REVISION	CCD	11-24-97	ISSUED BY	CCD	11-24-97	7-0021		B		
DATE	11-24-97	QUANTITY	CCD	11-24-97	DRAWN BY		DATE		PAGE 1 OF 1	